IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
	)	
Dale, et al.	)	Confirmation No. **8805**
	)	
Application No.: **10/540,730**	)	Art Unit: **1797**
	)	
Filed: **May 3, 2006**	)	Examiner: **Sally A. Sakelaris**
	)	
For: **Coatings**	)	
	)	

DECLARATION UNDER 37 C.F.R. §1.132 OF NICHOLAS DALE, PH.D.

I, Nicholas Dale, Ph.D., hereby declare:

1. I received my BA with Honours in 1981 from the University of Cambridge and my Ph.D. from the University of Bristol in 1984. I received Postdoctoral Training at the Karolinska Institute in Stockholm, Sweden, with Professor Sten Grillner, and at the Howard Hughes Medical Institute, Columbia University, NY, with Dr. Eric Kandel. I am Professor at the University of Warwick and have worked in the field of biosensors for about 14 years. I have attached a copy of my curriculum vitae to this Declaration.

2. I am co-inventor of U.S. Patent Application Serial No. 10/540,730. I am familiar with this patent application and the area of science dealing with sensor coating methods. I am co editing a book with Dr. Stephane Marinesco entitled "Microelectrode Biosensors" to be published by Humana Press.

3. I have read and understood the subject matter of the Office Action dated 27 August 2010 (hereinafter the Office Action). In the Office Action the Examiner objects that the claims are unpatentable over Zhang *et al* (Analytica Chemica Acta 388 (1999) 71-78, hereinafter Zhang). The Examiner alleges that it would have been obvious to one of ordinary skill in the art to change the size of the electrode in Zhang, since a modification would have involved a mere change in the size (or dimension) of a component. The Examiner alleges that it is well-known in the art that the smaller the electrode, the more

compact, lighter and desirable it is and that many design parameters are taken into consideration when determining the size of electrodes of biomedical applications. I respectfully disagree with the Examiner's conclusion. The authors of Zhang apply 20 µl of silicate sol-gel containing an enzyme onto a flat surface (5mm disk electrode). The sol-gel was then left to dry on the surface for 24 hours at 4°C, as specified in section 2.3 of the paper. This method evidently works for a flat electrode of this size where it is possible for the droplet of sol-gel to remain and slowly cure. However, a needle shaped microelectrode of, for example, 0.5 - 2mm long and 25 - 50 µm in diameter (that is at least 100 times smaller diameter) would behave differently. The method shown in Zhang would not be effective for coating such an electrode for a very simple reason; the volume of sol-gel would simply run or drip off the electrode surface and would not be retained to cross-link and gelate on the surface. This would produce electrodes of either no sensitivity or extremely low sensitivity.

4. In the Office Action the Examiner referred to the article by Collinson *et al* (Analytica Chemica Acta 397 (1999) 113-121, hereinafter Collison). Again, those authors use a disk shaped electrode, 5mm in diameter. Section 2.2 of that paper describes how they spin coat 30µl of sol-gel mix onto this surface. This is then cured at 80°C for one hour. This step would denature any enzymes present. Thus, this method has two drawbacks; (1) it is incompatible with microelectrodes as it suffers the same problem as outlined above for Zhang; and (2) it is not compatible with the retention of enzymatic activity.

5. I declare that in my opinion neither of the methods proposed by Zhang and Collison and identified by the Examiner as prior art are capable of being used to fabricate microelectrode biosensors.

6. The presently claimed invention solves both of these problems for microelectrode biosensors by using extremely mild conditions to controllably deposit sol-gels onto microelectrode surfaces via a pH change induced very locally at the surface to accelerate cross-linking and gelation onto the surface. This produces a method that reliably and rapidly coats silicate layers onto very small electrodes.

7. For at least the reasons provided above concerning Zhang and Collison, I therefore believe that the Examiner is mistaken in stating that the invention, as claimed, is obvious over the prior art. As one skilled in this art, Zhang and Collison provide no suggestion or motivation to derive the presently claimed microelectrodes as their methods would not work for making the presently claimed microelectrodes.

8. I declare further that all statements made herein are of my own knowledge and are true, and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that wilful false statements and the like so made are punishable by fine, or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such wilful false statements may jeopardize the validity of any patent issuing on this application.

Nicholas Dale
Signature

Nicholas Dale, Ph.D.

24/1/11
Date

Curriculum vitae of Nicholas Dale

Address

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Date of Birth: 26th March 1960 **Nationality:** British

Education

1981 University of Cambridge, Zoology, BA (Honours) 1st Class.

1984 University of Bristol, PhD.

Postdoctoral Training

1984-85 Professor Sten Grillner, Karolinska Institute, Stockholm.

1986-88 Dr Eric Kandel, Howard Hughes Medical Institute, Columbia University, New York.

Positions Held

Royal Society 1983 University Research Fellow, School of Biological Sciences, University of Bristol (1989-1992).

Royal Society Locke Research Fellow, School of Biological Sciences, University of Bristol (1992-1995).

Royal Society Locke Research Fellow and Reader of Neuroscience, School of Biological & Medical Sciences, University of St Andrews (1995-1997).

Reader of Neuroscience, School of Biomedical Sciences, University of St Andrews. (1997- 1999).

Professor of Neuroscience, School of Biomedical Sciences, University of St Andrews (1999-2000).

Ted Pridgeon Professor of Neuroscience, Department of Biological Sciences, University of Warwick (2000-).

University Responsibilities

Head of Neuroscience Research Group, Department of Biological Sciences.

Head of Physiological & Developmental Systems Theme, Department of Biological Sciences.

RAE 2008 Coordinator for Department of Biological Sciences.

University Research Ethics Committee.

Member of steering group for Centre for Analytical Sciences.

Member of steering group for the Neuroscience and Society Group at Warwick.

Co-Director of Warwick-NTU Neurosciences Research in Singapore (2010-2015).

Honours

International Award for Young Investigators in the Neurosciences from The Demuth Swiss

Medical Research Foundation, in the field of "Structure and Function of the Synapse". (1989)

President's Medal of the Society for Experimental Biology. (1989)

Scientific Medal of the Zoological Society of London. (1998)

Visiting Professor of Physiology, University College London. (2003-2006)

International Scientific Advisory Board for Purines 2008, Copenhagen.

International Scientific Advisory Board for Fukuoka Purine 2009, Fukuoka, Japan.

Committee Member of the UK National Purine Club.

Scientific Advisory Board for the British Neuroscience Association.

Special Issue Editor for Sensors: State-of-the-art sensors technology in the UK.

Enterprise Champion, University of Warwick, 2010.

Awards & Grants

The Wellcome Trust (2003-2006) Ectonucleotidases and the regulation of motor pattern generation.

The Wellcome Trust (2003-2006) Commercialization of purine biosensors: essential tools for the scientific and clinical communities.

MRC (2006-2009) ATP a mediator of central chemoreception in brain stem.

EU FP6 (2006-2009) Synthesis and application of nanostructured tethered silicates. Two component work packages:"Ultra-microbiosensors" and "Optical Nanosensors".

MRC Milstein Award (2007-2009) All dressed up and nowhere to go –finding the glucosensing party for hypothalamic tanycytes.

MRC (2008-2011) Action potential- and Ca^{2+}-dependent adenosine release in the cerebellum: release mechanisms and signalling properties. (co-PI with Dr Mark Wall).

The Wellcome Trust (2009-2012). Adenosine release in the preoptic forebrain areas that control sleep: assessing the roles of astrocytes..

Advantage West Midlands Science Cities Project (2009-2010) –Advanced Optical Microscopy for Neurosciences..

MRC (2011-2014) How the brain senses CO_2.

Invited lecures and meeting organisation

8th International Symposium on Adenosine and Adenine Nucleotides, "Purinergic signalling triggers development of the eye", Ferrara, May 2006.

Organiser and Chair: "Adenosine in the regulation of sleep", Purines 2008, Copenhagen.

Organiser and Chair: "Real time measurements of purine release", Purines 2008, Copenhagen.

Plenary lecture: "From chemoreception to eye development -fundamental roles of ATP signalling", Purines 2008, Copenhagen.

Experimental Biology 2009: "New molecular principles of CO_2 chemosensory transduction". New Orleans, 2009.

Chair: "Neuron-glia interactions", Fukuoka Purine 2009, Fukuoka, Japan.

Invited seminar, Institut für Herz- und Kreislaufphysiologie, Heinrich-Heine-Universität, Düsseldorf.

Invited speaker: International Union of Physiological Sciences 2009: "Novel mechanism of central chemosensitivity". Kyoto, 2009.

Lunchtime Lecture: International Union of Physiological Sciences 2009: "Past, present and future adventures in biosensing". Kyoto, 2009.

Hippocampal function and dysfunction: "How the brain senses CO_2 directly via CO_2 sensitive connexins". Potsdam, Germany, 2009.

"How the brain senses CO_2 directly via CO_2 sensitive connexins". EC Advanced Workshop on Infochemical Communication Technology (iCHEM), Granada, March 2010.

University of Copenhagen, May 2010. Invitation to spend the day with, and speak on the topic of CO_2 chemoreception, the PhD students enrolled in Current Topics in Cell & Molecular Biology, Department of Biology.

In vivo Neurochemistry. A Symposium at the University of Lyon, May 2010.

Organiser and Chair: "Neuron-glia interactions: systems level implications", April 2011 Biennial Meeting of the British Neuroscience Association.

Invited speaker, SEB Symposium "Gas detection in animal cells", Glasgow July 2011.

Plenary Lecture, Italian-German Purine Club, Bonn July 2011.

Examinerships

External examiner for the Neuroscience MSc course at Edinburgh (2000-2003).

External PhD examiner, University of Birmingham (2001).

External PhD examiner, University of Wellington, New Zealand (2006).

External PhD examiner, University Sains Malaysia, Malaysia (2010).

Editorships and books

Reviewing Editor for Journal of Physiology. (1996-2001)

Distributing Editor for Journal of Physiology. (1998-2000)

Guest Editor for Sensors –State of the Art Sensor Technology in the UK, 2010.

Co-Editor (with Dr Stephane Marinesco, Lyon) of book to be published by Humana Press (Springer Scientific): "Microelectrode biosensors".

Associate Editor for Purinergic Signalling. (2010-)

Granted Patents

WO2004048603: Sensor Coating Method.

WO2008081193: Ruthenium Purple Biosensor.

Spin-out Activity

Founder, Director and Chief Technology Officer of Sarissa Biomedical Ltd (www.sarissa-biomedical.com). Sarissa was spun-out from the University of Warwick in November 2002 and is dedicated to providing state of the art biosensors for a range of analytes to the scientific and clinical research communities. Sarissa was made possible as a commercial venture by our invention of a novel silicate coating technology that has enabled highly reliable production of very robust microelectrode biosensors that can be shipped all over the world. The key IP that underlies Sarissa is protected by patents WO2004048603 and WO2008081193.

Original peer-reviewed publications (4783 citations, H factor 36)

1. Huckstepp, R.T.R. and Dale, N. (2011) CO_2-dependent opening of an inwardly rectifying K^+ channel. **Pflügers Archiv** DOI:10.1007/s00424-010-0916-z.

2. Klyuch, B., Richardson, M.J., Dale, N. and Wall, M.J. (2011) The dynamics of single spike-evoked adenosine release in the cerebellum. **J Physiol** *589,* 283-295.

3. Wall, M., Eason, R. and Dale, N. (2010) Biosensor measurement of purine release from cerebellar cultures and slices. **Purinergic Signalling** *6,* 339-348.

4. Huckstepp, R.T.R., id Bihi, R., Eason, R., Spyer, K.M., Dicke, N., Willecke, K., Marina, N., Gourine, A.V. and Dale, N. (2010) Connexin hemichannel-mediated CO_2-dependent release of ATP in the medulla oblongata contributes to central respiratory chemosensitivity. **J Physiol** *588,* 3901-3920. ***Faculty1000 evaluation 12.***

5. Huckstepp, R.T.R., Eason, R., Sachdev, A. and Dale, N. (2010) CO_2-dependent opening of connexin 26 and related β connexins. **J Physiol** *588,* 3921-3931.

6. Tian, F. Wu, W. Broderick, M. Vamvakaki, V. Chaniotakis, N. and Dale, N. (2010) Novel microbiosensors prepared utilizing biomimetic silicification method. **Biosens Bioelectron** *25,* 2408-2413.

7. Masse, K., Bhamra, S., Allsop, G., Dale, N. and Jones, E.A. (2010) Ectophosphodiesterase/nucleotide phosphohydrolase (ENPP) nucleotidases: cloning, conservation and developmental restriction. **Int J Dev Biol** *54,* 181-193,

8. Tian, F. Gourine, A.V., Huckstepp, R.T.R. and Dale, N. (2009) A microelectrode biosensor for real time monitoring of L-glutamate release. **Anal Chim Acta** *645,* 86-91.

9. Etherington, L.V., Patterson, G.E., Meechan, L., Boison, D., Irving, A.J., Dale, N. and Frenguelli, B.G. (2008) Astrocytic adenosine kinase regulates basal synaptic adenosine levels and seizure activity but not activity-dependent adenosine release in the hippocampus. **Neuropharmacology** *56,* 429-437.

10. Wall, M.J., Wigmore, G., Lopatár, J., Frenguelli, B.G. and Dale, N. (2008) The novel NTPDase inhibitor sodium polyoxotungstate (POM-1) inhibits ATP breakdown but also blocks central synaptic transmission, an action independent of NTPDase inhibition. **Neuropharmacology** *55,* 1251-1258

11. Gourine, A.V., Dale, N., Korsak, A., Llaudet, E., Tian, F., Huckstepp, R. and Spyer, K.M (2008) Release of ATP and glutamate in the nucleus tractus solitarii mediate pulmonary stretch receptor (Breuer-Hering) reflex pathway. **J Physiol** *586,* 3963–3978. ***Faculty1000 evaluation 12.***

12. Gourine, A.V., Dale, N., Llaudet, E., Poputnikov, D., Spyer, K.M., Gourine, V.N. (2007) Release of ATP in the central nervous system during systemic inflammation: Real-time measurement in the hypothalamus of conscious rabbits. **J Physiol** *585,* 305-316.

13. Massé, K., Bhamra, S., Eason, R., Dale, **N**. and Jones, E. (2007) Purine-mediated signalling triggers eye development. **Nature** *449*, 1058-1062. *Faculty1000 evaluation 14.*

14. Tian, F., Llaudet, E. and Dale, **N.** (2007) Ruthenium Purple-mediated microelectrode biosensors based on sol-gel film. **Anal Chem** *79*, 6760-6766.

15. Wall, M., Atterbury, A. and Dale, **N.** (2007) Control of basal extracellular adenosine concentration in rat cerebellum. **J Physiol** *582*, 137-151.

16. Wall, M. and Dale, **N.** (2007) Autoinhibition of parallel fibre-Purkinje cell synapses by activity dependent adenosine release. **J Physiol** *581*, 553-565.

17. Frenguelli, B.G., Wigmore, G., Llaudet, E., and Dale, **N.** (2007). Temporal and mechanistic dissociation of ATP and adenosine release during ischemia in the mammalian hippocampus. **J Neurochem** *101*, 1400-1413.

18. Massé, K., Eason, R., Bhamra, S. Dale, N., and Jones, E. (2006) Comparative genomic and expression analysis of the conserved NTPDase family in *Xenopus*. **Genomics** *87*, 366-381.

19. Gourine, A.V., Llaudet, E., Dale, N., and Spyer, K.M. (2005) ATP is mediator of chemosensory transduction in the central nervous system. **Nature** *436*, 108-111. *Faculty1000 evaluation 15.*

20. Pearson, R.A., Dale, N., Llaudet, E., and Mobbs, P. (2005) ATP released via gap junction hemichannels from the pigment epithelium regulates neural retina progenitor proliferation. **Neuron** *46*, 731-744. *Faculty1000 evaluation 10.*

21. Llaudet, E., Hatz, S., Droniou, M., and Dale, N. (2005) Microelectrode biosensor for real-time measurement of ATP in biological tissue. **Anal Chem** *77*, 3267-3273.

22. Gourine, A.V., Llaudet, E., Dale, N., and Spyer, K.M. (2005). Release of ATP in the ventral medulla during hypoxia in rats: role in hypoxic ventilatory response. **J Neurosci** *25*, 1211-1218.

23. Gadalla, A.E., Pearson, T., Currie, A.J., Dale, N., Hawley, S.A., Sheehan, M., Hirst, W., Michel, A.D., Randall, A., Hardie, D.G., and Frenguelli, B.G. (2004). AICA riboside both activates AMP-activated protein kinase and competes with adenosine for the nucleoside transporter in the CA1 region of the rat hippocampus. **J Neurochem** *88*, 1272-1282. *42 citations*

24. Llaudet, E., Botting, N.P., Crayston, J.A., and Dale, N. (2003). A three-enzyme microelectrode sensor for detecting purine release from central nervous system. **Biosens Bioelectron** *18*, 43-52.

25. Jimenez-Gonzalez, C., McLaren, G.J., and Dale, N. (2003). Development of Ca^{2+}-channel and BK-channel expression in embryos and larvae of *Xenopus laevis*. **Eur J Neurosci** *18*, 2175- 2187.

26. Frenguelli, B.G., Llaudet, E., and Dale, N. (2003). High-resolution real-time recording with microelectrode biosensors reveals novel aspects of adenosine release during hypoxia in rat hippocampal slices. **J Neurochem** *86*, 1506-1515.

27. Dale, N. (2003). Coordinated motor activity in simulated spinal networks emerges from simple biologically plausible rules of connectivity. **J Comput Neurosci** *14*, 55-70.

28. Aiken, S.P., Kuenzi, F.M. and Dale, **N.** (2003). *Xenopus* embryonic spinal neurons recorded in situ with patch-clamp electrodes -conditional oscillators after all? **Eur J Neurosci** *18*, 333- 343.

29. Gourine, A.V., Llaudet, E., Thomas, T., Dale, **N.**, and Spyer, K.M. (2002). Adenosine release in nucleus tractus solitarii does not appear to mediate hypoxia-induced respiratory depression in rats. **J Physiol** *544*, 161-170.

30. Dale, **N.**, Gourine, A.V., Llaudet, E., Bulmer, D., Thomas, T., and Spyer, K.M. (2002). Rapid adenosine release in the nucleus tractus solitarii during defence response in rats: real-time measurement *in vivo*. **J Physiol** *544*, 149-160.

31. Dale, N. (2002). Resetting intrinsic purinergic modulation of neural activity: an associative mechanism? **J Neurosci** *22*, 10461-10469.

32. Brown, P., and Dale, N. (2002). Modulation of K^+ currents in *Xenopus* spinal neurons by p2y receptors: a role for ATP and ADP in motor pattern generation. **J Physiol** *540*, 843-850.

33. Brown, P., and Dale, N. (2002). Spike-independent release of ATP from *Xenopus* spinal neurons evoked by activation of glutamate receptors. **J Physiol** *540*, 851-860.

34. Begg, M., Dale, N., Llaudet, E., Molleman, A., and Parsons, M.E. (2002). Modulation of the release of endogenous adenosine by cannabinoids in the myenteric plexus-longitudinal muscle preparation of the guinea-pig ileum. **Br J Pharmacol** *137*, 1298-1304.

35. Pearson, T., Nuritova, F., Caldwell, D., Dale, N., and Frenguelli, B.G. (2001). A depletable pool of adenosine in area CA1 of the rat hippocampus. **J Neurosci** *21*, 2298-2307.

36. Dale, N., Pearson, T., and Frenguelli, B.G. (2000). Direct measurement of adenosine release during hypoxia in the CA1 region of the rat hippocampal slice. **J Physiol** *526*, 143-155.

37. Brown, P., and Dale, N. (2000). Adenosine A1 receptors modulate high voltage-activated Ca^{2+} currents and motor pattern generation in the *Xenopus* embryo. **J Physiol** *525*, 655-667.

38. Sun, Q.Q., and Dale, N. (1999). G-proteins are involved in 5-HT receptor-mediated modulation of N- and P/Q- but not T-type Ca^{2+} channels. **J Neurosci** *19*, 890-899.

39. Sun, Q., and Dale, N. (1998). Developmental changes in expression of ion currents accompany maturation of locomotor pattern in frog tadpoles. **J Physiol** *507*, 257-264.

40. Sun, Q.Q., and Dale, N. (1998). Differential inhibition of N and P/Q Ca^{2+} currents by 5-HT1A and 5-HT1D receptors in spinal neurons of *Xenopus* larvae. **J Physiol** *510*, 103-120.

41. Kuenzi, F.M., and Dale, N. (1998). The pharmacology and roles of two K^+ channels in motor pattern generation in the *Xenopus* embryo. **J Neurosci** *18*, 1602-1612.

42. Dale, N. (1998). Delayed production of adenosine underlies temporal modulation of swimming in frog embryo. **J Physiol** *511*, 265-272.

43. Sun, Q.Q., and Dale, N. (1997). Serotonergic inhibition of the T-type and high voltage activated Ca^{2+} currents in the primary sensory neurons of *Xenopus* larvae. **J Neurosci** *17*, 6839-6849.

44. Kuenzi, F.M., and Dale, N. (1996). Effect of capsaicin and analogues on potassium and calcium currents and vanilloid receptors in *Xenopus* embryo spinal neurones. **Br J Pharmacol** *119*, 81-90.

45. Dale, N., and Gilday, D. (1996). Regulation of rhythmic movements by purinergic neurotransmitters in frog embryos. **Nature** *383*, 259-263.

46. Wall, M.J., and Dale, N. (1995). A slowly activating Ca^{2+}-dependent K^+ current that plays a role in termination of swimming in *Xenopus* embryos. **J Physiol** *487*, 557-572.

47. Dale, N. (1995). Kinetic characterization of the voltage-gated currents possessed by *Xenopus* embryo spinal neurons. **J Physiol** *489*, 473-488.

48. Dale, N. (1995). Experimentally derived model for the locomotor pattern generator in the *Xenopus* embryo. **J Physiol** *489*, 489-510.

49. Wall, M.J., and Dale, N. (1994). A role for potassium currents in the generation of the swimming motor pattern of *Xenopus* embryos. **J Neurophysiol** *72*, 337-348.

50. Wall, M.J., and Dale, N. (1994). GABAB receptors modulate an w-conotoxin-sensitive calcium current that is required for synaptic transmission in the *Xenopus* embryo spinal cord. **J Neurosci** *14*, 6248-6255.

51. Wall, M.J., and Dale, N. (1993). GABAB receptors modulate glycinergic inhibition and spike threshold in *Xenopus* embryo spinal neurones. **J Physiol** *469*, 275-290.

52. Dale, N., and Kandel, E.R. (1993). L-glutamate may be the fast excitatory transmitter of *Aplysia* sensory neurons. **Proc Natl Acad Sci U S A** *90*, 7163-7167.

53. Dale, N. (1993). A large, sustained Na^+- and voltage-dependent K^+ current in spinal neurons of the frog embryo. **J Physiol** *462*, 349-372.

54. Ghirardi, M., Braha, O., Hochner, B., Montarolo, P.G., Kandel, E.R., and Dale, N. (1992). Roles of PKA and PKC in facilitation of evoked and spontaneous transmitter release at depressed and nondepressed synapses in *Aplysia* sensory neurons. **Neuron** *9*, 479-489.

55. Dale, N. (1991). The Isolation and Identification of Spinal Neurons That Control Movement in the *Xenopus* Embryo. **Eur J Neurosci** *3*, 1025-1035.

56. Edmonds, B., Klein, M., Dale, N., and Kandel, E.R. (1990). Contributions of two types of calcium channels to synaptic transmission and plasticity. **Science** *250*, 1142-1147.

57. Dale, N., and Kandel, E.R. (1990). Facilitatory and inhibitory transmitters modulate spontaneous transmitter release at cultured *Aplysia* sensorimotor synapses. **J Physiol** *421*, 203-222.

58. Brodin, L., Dale, N., Christenson, J., Storm-Mathisen, J., Hokfelt, T., and Grillner, S. (1990). Three types of GABA-immunoreactive cells in the lamprey spinal cord. **Brain Res** *508*, 172- 175.

59. Braha, O., Dale, N., Hochner, B., Klein, M., Abrams, T.W., and Kandel, E.R. (1990). Second messengers involved in the two processes of presynaptic facilitation that contribute to sensitization and dishabituation in *Aplysia* sensory neurons. **Proc Natl Acad Sci U S A** *87*, 2040-2044.

60. Roberts, A., Dale, N., Ottersen, O.P., and Storm-Mathisen, J. (1988). Development and characterization of commissural interneurones in the spinal cord of *Xenopus laevis* embryos revealed by antibodies to glycine. **Development** *103*, 447-461.

61. Dale, N., Schacher, S., and Kandel, E.R. (1988). Long-term facilitation in *Aplysia* involves increase in transmitter release. **Science** *239*, 282-285.

62. Roberts, A., Dale, N., Ottersen, O.P., and Storm-Mathisen, J. (1987). The early development of neurons with GABA immunoreactivity in the CNS of *Xenopus laevis* embryos. **J Comp Neurol** *261*, 435-449.

63. Piomelli, D., Volterra, A., Dale, N., Siegelbaum, S.A., Kandel, E.R., Schwartz, J.H., and Belardetti, F. (1987). Lipoxygenase metabolites of arachidonic acid as second messengers for presynaptic inhibition of *Aplysia* sensory cells. **Nature** *328*, 38-43.

64. Dale, N., Kandel, E.R., and Schacher, S. (1987). Serotonin produces long-term changes in the excitability of *Aplysia* sensory neurons in culture that depend on new protein synthesis. **J Neurosci** *7*, 2232-2238.

65. Dale, N., Roberts, A., Ottersen, O.P., and Storm-Mathisen, J. (1987). The morphology and distribution of 'Kolmer-Agduhr cells', a class of cerebrospinal-fluid-contacting neurons revealed in the frog embryo spinal cord by GABA immunocytochemistry. **Proc R Soc Lond B Biol Sci** *232*, 193-203.

66. Dale, N., Roberts, A., Ottersen, O.P., and Storm-Mathisen, J. (1987). The development of a population of spinal cord neurons and their axonal projections revealed by GABA immunocytochemistry in frog embryos. **Proc R Soc Lond B Biol Sci** *232*, 205-215.

67. Buchanan, J.T., Brodin, L., Dale, N., and Grillner, S. (1987). Reticulospinal neurones activate excitatory amino acid receptors. **Brain Res** *408*, 321-325.

68. Dale, N., and Grillner, S. (1986). Dual-component synaptic potentials in the lamprey mediated by excitatory amino acid receptors. **J Neurosci** *6*, 2653-2661.

69. Dale, N. (1986). Excitatory synaptic drive for swimming mediated by amino acid receptors in the lamprey. **J Neurosci** *6*, 2662-2675.

70. Dale, N., Ottersen, O.P., Roberts, A., and Storm-Mathisen, J. (1986). Inhibitory neurones of a motor pattern generator in *Xenopus* revealed by antibodies to glycine. **Nature** *324*, 255- 257.

71. Roberts, A., Dale, N., Evoy, W.H., and Soffe, S.R. (1985). Synaptic potentials in motoneurons during fictive swimming in spinal *Xenopus* embryos. **J Neurophysiol** *54*, 1-10.

72. Dale, N., and Roberts, A. (1985). Dual-component amino-acid-mediated synaptic potentials: excitatory drive for swimming in *Xenopus* embryos. **J Physiol** *363*, 35-59.

73. Dale, N. (1985). Reciprocal inhibitory interneurones in the *Xenopus* embryo spinal cord. **J Physiol** *363*, 61-70.

74. Dale, N., and Roberts, A. (1984). Excitatory amino acid receptors in *Xenopus* embryo spinal cord and their role in the activation of swimming. **J Physiol** *348*, 527-543.

75. Roberts, A., Dale, N., and Soffe, S.R. (1984) Sustained responses to brief stimuli: Swimming in *Xenopus* embryos. **J Exp Biol** *112*, 321-325.

76. Williams, E.J., Dale, N., Trites, L.F., and Fensom, D.S. (1984) K^+ and Na^+ influxes in *Nitella* modified by pH and electric current. **Physiol Plant** *62*, 215-218.

77. Dale, N., Lunn, G., Fensom, D.S. and Williams, E.J. (1983) Rates of axial transport of ^{11}C and ^{14}C in Characean cells: faster than visible streaming? **J Exp Bot** *34*, 130-143.

Other peer-reviewed publications

1. Dale, N. (2009) Highlights in purinergic signalling. **Purinergic Signalling** *5*, 427-430.

2. Dale, N. and Frenguelli, B.G. (2009) Release of adenosine and ATP during ischemia and epilepsy. **Current Neuropharmacology** *7*, 160-179.

3. Wall, M. and Dale, N. (2008) Activity-dependent release of adenosine –a critical re-evaluation of mechanism. **Current Neuropharmacology** *6*, 329-337.

4. Dale, N. (2008) Dynamic ATP signalling and neural development. **J Physiol** *586*, 2429-2436.

5. Dale, N. (2006) The acid nature of CO_2-evoked adenosine release in the CNS. **J Physiol** *574*, 633.

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